## REMARKS

ISSUES UNDER 35 USC § 103

U.S. Patent No. 4,777,583 to Minami et al discloses a thermal head that includes a heat-generating resistor (Abstract). The present invention is not directed to thermal heads. In particular, the present invention is directed towards a "thin film resistor with a moisture barrier." Thus, the preamble of claim 1 distinguishes the present invention from thermal heads. Claim 1 requires "depositing the moisture barrier comprising a layer of tantalum pentoxide film." Claim 1 was amended to make clear that the tantalum pentoxide film serves as the moisture barrier. In addition, claim 1 was amended to make more explicit that claim 1 is directed towards thin film resistors and not thermal heads.

Minami et al is not analogous art. Whether art is analogous or not depends upon the necessary function or utility of the subject matter covered by the claims. MPEP § 904.01(c). In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the invention is concerned. MPEP § 2141.01(a). The Applicant's claimed process relates to a method of forming an improved thin film resistor. Minami et al is directed towards a thermal head (Abstract). Minami et al is classified in class 346/76 PH (related to thermal recording) and 219/547 (related to electric heating). The Applicant's claimed invention is not in the field of thermal recording or electric heating, but rather is directed towards a method of manufacture of a deposited thin film resistor (i.e. 438/384). Furthermore, nothing in Minami discusses the problem of the electrolytic corrosion of a resistor under powered moisture conditions, thus Minami would not be reasonably pertinent to Applicant's problem. For these

reasons, Minami et al should not be considered analogous art and this rejection should be withdrawn.

Minami is directed towards a thermal head that includes a heat-generating resistor. Thus, Minami includes a glaze layer. Placing the heat generating resistors of Minami on a glaze layer would allow the resistors to quickly generate heat when electricity is applied. Each of the heat generating resistors of Minami is at least partially on the glaze layer, although Minami discloses that a part of the heat generating resistor can be directly on the substrate (Figure 2; col. 5, lines 12-20). The Applicants' claimed invention does not concern thermal heads, but rather a passive device -- a thin film resistor. Applicant's claim language requires "depositing a metal film resistive layer on a thin film resistor substrate" and "attaching a thin film resistor termination on each end of the metal film resistive layer." The Examiner argues that the termination of claim 1 is the same as the electrodes of Minami. Claim 1 has been amended to make explicit that claim 1 requires "thin film resistor termination." Minami does not provide for "attaching a thin film resistor termination on each end of the metal film resistive layer." Rather, Minami discloses an electrode layer formed substantially on the entire surface of the heat generating layer (col. 3, lines 15-18). Then Minami etches the exposed electrode layer to form divided electrode films (col. 3, lines 20-24). Minami's resulting structure includes both common and individual electrodes (col. 3, lines 27-30). Thus, Minami does not disclose "attaching a thin film resistor termination on each end of the metal film resistive layer." Rather, Minami uses a different process to produce a different product -- a thermal head as opposed to a thin film resistor having a termination on each end of the metal film resistive layer. Due to the different contexts of Minami and the present invention, there is the structural difference that the metal film resistive layer of claim 1 is on the thin film resistor substrate, whereas Minami requires the glaze layer on

the substrate such that the resistors are heat-generating. Further, the present invention requires "attaching a thin film resistor termination on each end of the metal film resistive layer" that is not taught by Minami.

The different context of Applicant's claimed invention is further distinguished from Minami by the addition of the functional limitation in claim 1 that the tantalum pentoxide film is used "to reduce failures due to electrolytic corrosion under powered moisture conditions." The advantage of reducing failures due to electrolytic corrosion under powered moisture conditions is not recognized in Minami. Further, where Minami uses chromium silicate or tantalum silicate (non-metals) there simply would not be that concern. Moreover, in the applications of thermal heads discussed (col. 1, lines 5-15) in Minami, there would not seem to be a particular concern about powered moisture conditions.

The Examiner states that "It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a thin film resistor with moisture barrier layer as taught by Minami et al because it allows for utilizing resistors to form thermal heads." There is no such motivation here because a thermal head reference such as Minami simply would not disclose or teach the method of claim 1.

Any application of Minami et al is merely using impermissible hind sight reconstruction based on the mere fact that Minami uses tantalum pentoxide. Minami does not recognize the problem of electrolytic corrosion under powered moisture conditions nor how that problem is solved through the use of tantalum pentoxide as a moisture barrier. Because Minami is directed towards a thermal head that uses a heat generating resistor instead of a thin film resistor, Minami simply does not teach or suggest the method of claim 1.

With respect to claim 2, the Examiner combines Minami et al with Young. Young discloses sputtering tantalum pentoxide but in a different context. Young relates to capacitors where tantalum pentoxide is used as a capacitor dielectric (Col. 2, lines 20-30). The advantage of reducing failures of a resistor "due to electrolytic corrosion under powered moisture conditions" is not recognized by Young.

With respect to claim 3-5, the Examiner relies upon Oki Electric Ind. Co. Ltd. (Japan 52-3196) for the proposition that a resistive layer can be either tantalum nitride or nickel-chromium. As the Applicant has explained in the specification, nickel-chromium is a common material for use as a resistive element. Oki still does not disclose a tantalum pentoxide layer formed on the resistance layer or recognize the advantage of reducing failures of a resistor "due to electrolytic corrosion under powered moisture conditions."

The Examiner has rejected claim 15 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,617,575 to Fuyama et al. in view of Sato (Japan 61-27264) and Oki Electric Ind. Co. Ltd. (Japan 52-3196). Fuyama and Sato are directed towards thermal heads and not thin film resistors, Fuyama and Sato are therefore not analogous art. Fuyama and Sato are just other examples of a thermal head where there is a heating resistor and are therefore readily distinguishable from the Applicant's claimed invention. In Fuyama, any tantalum pentoxide is used as an insulator and not "for reducing failures due to electrolytic corrosion under powered moisture conditions." Fuyama tends to teach away from the present invention in that Fuyama uses an insulating material of either silicon dioxide or tantalum pentoxide. This makes clear that Fuyama does not appreciate using tantalum pentoxide as a moisture barrier for reducing failures due to electrolytic corrosion under powered moisture conditions. Applicant's invention of claim 15 requires both the passivation layer (that can be silicon dioxide) in addition to the moisture

barrier of tantalum pentoxide. Therefore, these references are directed towards producing a different product, does not recognize the problems of electrolytic corrosion under powered moisture conditions in thin film resistors and does not provide any motivation or suggestion to combine.

No fees or extensions of time are believed to be due in connection with this amendment; however, consider this a request for any extension inadvertently omitted, and charge any additional fees to Deposit Account No. 26-0084.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

Reconsideration and allowance is respectfully requested.

Respectfully submitted,

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Application No. P04860US0

**AMENDMENT — VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**In the Claims**

Please amend claims 1 and 15 as follows:

1. (Twice Amended)

A method of manufacturing a thin film resistor with a moisture barrier comprising:

depositing a metal film resistive layer on a thin film resistor substrate;

attaching a thin film resistor termination on each end of the metal film resistive layer; and

depositing the moisture barrier comprising a layer of tantalum pentoxide film directly overlaying and attaching to the metal film resistive layer to reduce failures due to electrolytic corrosion under powered moisture conditions.

15. (Amended)

A method of manufacturing a thin film resistor with a moisture barrier comprising:

depositing a metal film resistive layer on a substrate;

attaching a termination on each end of the metal film resistive layer;

depositing a passivation layer directly overlaying and attaching to the metal film layer; and

depositing the moisture barrier comprising a layer of tantalum pentoxide film directly overlaying and attaching to the passivation layer for reducing failures due to electrolytic corrosion under powered moisture conditions.